

Spot Safety Project Evaluation

Project Log # 200505137

Spot Safety Project # 06-98-212

Spot Safety Project Evaluation of the Center Turn Lane Installation, Resurfacing and Removal of Parking along Both Sides of NC 410 – Brown St from US 74-76 Bus to The Southern City Limits of Chadbourne in Columbus County.

Documents Prepared By:

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Date

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Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 06-98-212 – The center turn lane installation, resurfacing and removal of parking along both sides of NC 410 – Brown St from US 74-76 Bus to the southern city limits of Chadbourn in Columbus county.

Introduction

In an attempt to assess the safety of our roads, the Safety Evaluation Group of the Traffic Safety Systems Management Section has evaluated the above project. The methodologies used in this evaluation offer various philosophies and ideas, in an effort to provide objective countermeasure crash reduction results. A naïve before and after analysis has been completed to measure the effectiveness of the spot safety improvement. Additional analysis methods were not utilized for this evaluation because a suitable comparison group was unattainable. This information is provided to you so the benefit or lack of benefit for this type of project can be recognized and utilized for future projects.

Project Information and Background from the Project File Folder

The spot safety project improvement countermeasure chosen for the subject location was the installation of a center turn lane along both sides of NC 410 using thermoplastic pavement markings, resurfacing and removal of the parking along both sides of NC 410 from US 74-76 Bus to the southern city limits of Chadbourn. NC 410 is a two-lane curb and gutter section with parking. Commercial development is prevalent through the subject section. NC 410 has a speed limit of 35 mph. The Chadbourn town council requested this improvement.

The initial crash analysis was completed from April 1, 1995 through March 31, 1998 with a total of sixty-eight (68) reported crashes. There were 25 Rear End (slow / stop) crashes, which were deemed correctable by the improvement. In addition, there were 2 crashes involving parked vehicles, 5 left turn crashes and 2 rear end while turning crashes. There was 1 class B and 40 class C injuries resulting from these crashes. The statement of the problem was the increasing accident experience on this section of NC 410 with a pattern of rear end crashes emerging due to the presence of multiple driveway entrances and the lack of sufficient left turn storage. The final completion date for the improvement at the subject location was on January 31, 2001 at a cost of \$142,000.

Naïve Before and After Analysis

After reviewing the spot safety project file folder along with all the crashes at the subject location, the crash data omitted from this analysis to consider for an adequate construction period was from August 1, 2000 through July 31, 2001. The before period consisted of reported crashes from March 1, 1997 through July 31, 2000 (3 Years, 5 Months) and the after period consisted of reported

crashes from August 1, 2001 through December 31, 2004 (3 Years, 5 Months). The ending date for this analysis was determined by the available crash data at the time the crash analysis was completed. The treatment data consisted of all crashes on NC 410 from MP 13.58 to MP 14.92. A 0 feet Y-line was used in the analysis. Please see attached *Location Map* for further detail.

The following data Table 1 depicts the Naïve Before and After Analysis for the Total Crashes and Target Crashes at the treatment location. Table 2 provides an in depth examination of the Naïve Before and After Analysis of the Total Crashes and Table 3 provides an in depth examination of the Naïve Before and After Analysis for the Target “Correctable” crashes. Please note that the Target crashes for the center turn lane installation and parking removal include the following crash types: Rear End - Slow or Stop, Rear End - Turn, Parked Motor Vehicle, Left Turn – Same Roadway and Left Turn – Different Roadway.

<u>Table 1. Treatment Information</u>	Before Period	After Period	Percent Reduction (-)/ Percent Increase (+)
Total Crashes	83	75	- 9.6
Total Severity Index	3.85	3.66	- 4.9
Total Target Crashes	48	31	- 35.4
Target Severity Index	4.55	3.15	- 30.8
Volume	8500	9100	7.1

<u>Table 2. Total Crashes Information</u>	Before Period	After Period	Percent Reduction (-)/ Percent Increase (+)
Total Crashes	83	75	-9.6
Fatal Crashes	0	0	N/A
Non Fatal Injury Crashes	32	27	-15.6
Total Injury Crashes	32	27	-15.6
PDO Crashes	51	48	-5.9
Fatal Injuries	0	0	N/A
Non-Fatal Injuries	64	56	-12.5
Total Injuries	64	56	-12.5
Night Crashes	14	8	-42.9
Wet Crashes	10	10	0.0
Alcohol/ Drug Crashes	1	1	0.0

Table 3. Target Crashes Information	Before Period	After Period	Percent Reduction (-)/ Percent Increase (+)
Total Target Crashes	48	31	-35.4
Fatal Crashes	0	0	N/A
Non Fatal Injury Crashes	23	9	-60.9
Total Injury Crashes	23	9	-60.9
PDO Crashes	25	22	-12.0
Fatal Injuries	0	0	N/A
Non-Fatal Injuries	50	23	-54.0
Total Injuries	50	23	-54.0
Night Crashes	5	5	0.0
Wet Crashes	7	3	-57.1
Alcohol/ Drug Crashes	0	0	N/A

The naive before and after analysis at the treatment location resulted in a 9.6 percent decrease in Total Crashes, a 4.9 percent decrease in the Total Severity Index, and a 7.1 percent increase in Average Daily Traffic (ADT). There was also a 35.4 percent decrease in Target Crashes and a 30.8 percent decrease in the Severity Index for Target Crashes. The before period ADT year was 1998 and the after period ADT year was 2003.

Results and Discussion

The naive before and after analysis involving the comparison of the treatment actual before data versus the treatment actual after data resulted in a 9.6 percent decrease in Total Crashes and a 35.4 percent decrease in Target Crashes. The summary results above demonstrate that the treatment location appears to have had a decrease in both Total and Target crashes from the before to the after period.

The parking along NC 410 was removed on October 6, 1998. The center turn lane was installed on NC 410 from Smith Rd (MP 13.89) to Kirkland St (MP 14.24) and from Second St (MP 14.43) to US 74-76 Bus (MP 14.92). The studied section of NC 410 includes two signalized intersections.

As previously stated the main reason for the improvement was to alleviate a pattern of rear end crashes. From the Crash Analysis it can be seen that “Rear End – Stop or Slow” crashes in particular were reduced by 52.6 percent from the before to the after period (38 crashes in the before period, 18 crashes in the after period). The severity index for this type of crashes was also reduced by 46 percent from the before to the after period. From the above analysis it can be said that the improvement was satisfactory.

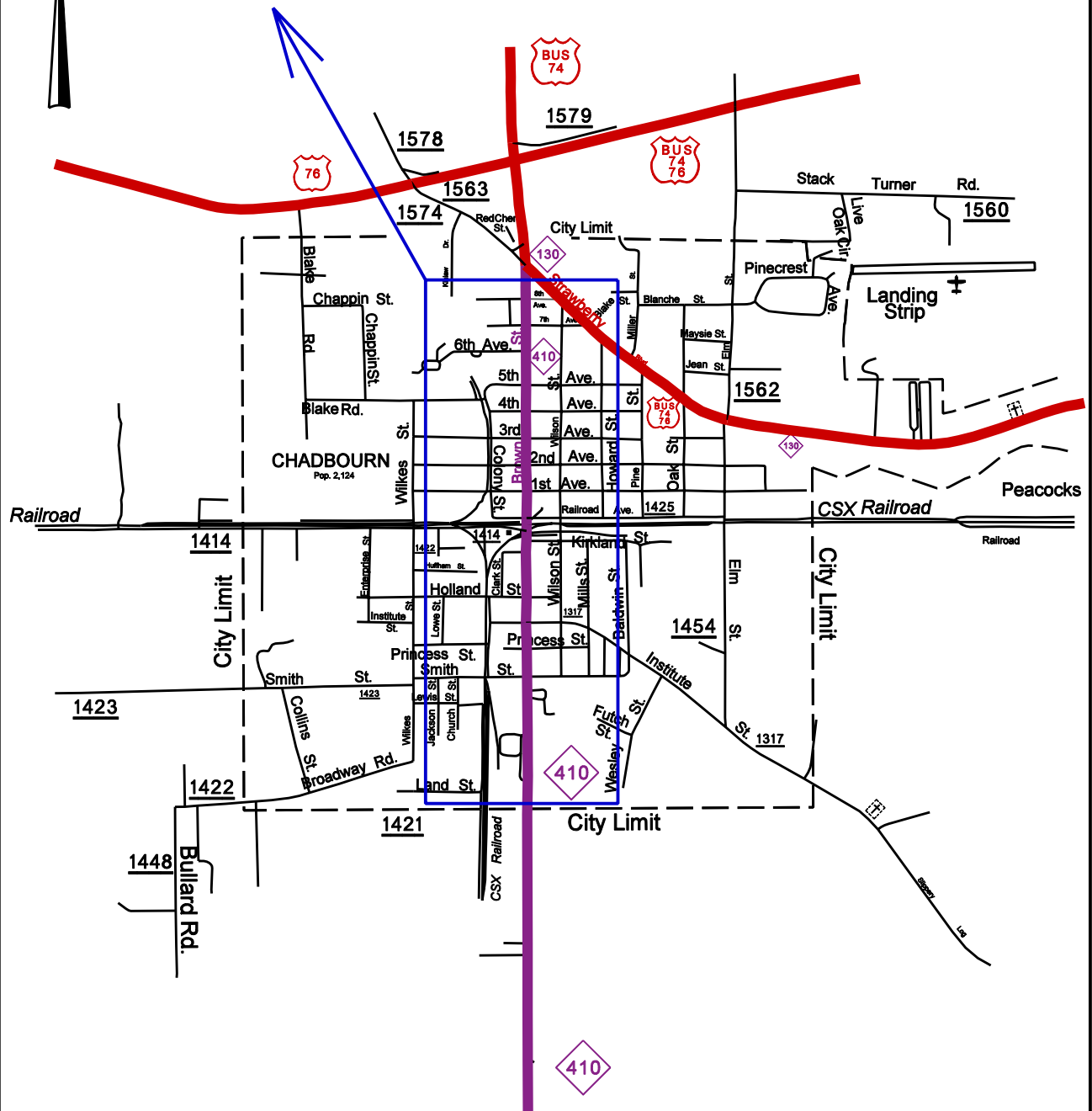
As the Safety Evaluation Group completes additional spot safety reviews for this type of countermeasure, we will be able to provide objective and definite information regarding actual crash reduction factors.

Evaluation of Spot Safety Project Number 06-98-212

Location Map, Columbus County

Treatment Site:

NC 410 – Brown St From US 74-76 Bus to The Southern City Limits of Chadbourn.



Treatment Location Photos Taken on June 13, 2005



Travelling North on NC 410 – Brown St



Travelling North on NC 410 – Brown St



Travelling North on NC 410 – Brown St



Travelling North on NC 410 – Brown St